59
APR
vol. 4
no. 4

concrete construction

ARTICLES

THE PIVOT MAN

Every now and then someone asks us about the philosophy underlying the messages which have appeared in this space every month for the past two years. Since the answer is more than a little off beat, particularly so far as modern practices of the art of advertising are concerned, perhaps other readers also would like to know why an important share of Concrete Transport Mixer Company's current advertising budget is being spent in a magazine designed primarily for people who use ready mixed concrete, rather than for those who produce and sell it.

Basically our messages here are rooted in our conviction that we as a company can design, manufacture and merchandise ready mixed concrete trucks which will compete advantageously with other makes of similar equipment so long as there is a continuing strong demand for ready mixed concrete itself. We believe our truck mixers have played a significant role in the growth and development of the ready mix industry, as have units made by our competitors, and as have the businessmen who make up the ready mix industry today.

But the pivot man in this whole picture is, and has always been, the USER of ready mixed concrete. Only his acceptance of the product itself, and his skill and knowledge in using it, make it possible for our industry to exist at all. We know of few materials in any industry, and none in the construction industry, in which the integrity and performance of the end product are so largely controlled by the purchaser.

So these messages are our tribute to our customers' customers and to our competitors' customers' customers—a small contribution by one truck mixer manufacturer to the cause of better communication and clearer understanding in a field which can never have enough of either.

Makers of the outstanding ROCKET concrete truck mixers

CONCRETE TRANSPORT MIXER CO.

4975 Fyler Avenue • **St. Louis 9, Missouri**

Here a modern electric vibrator is being used to consolidate concrete on one of the upper floors of a department store building.

Part 2

A PRIMER ON VIBRATION

Some job-site hints on how to get the most out of your vibrators

VIBRATORS HAVE COME A LONG WAY since their modest beginnings only a short time ago. Manufacturers have developed them into effective, dependable tools with which contractors can both improve the quality of their work and increase their profits. This is a compelling combination well worth the consideration of all businessmen.

However, to realize these advantages fully, care must be exercised. The success of vibration hinges to a great extent on field practices. Control of the rigidity and watertightness of formwork, vibration period, vibratory technique, equipment maintenance and a multitude of other variables on the job site require vigilant, experienced supervision. The importance of good foremen and good vibrator operators soon becomes apparent in work involving vibration, which is used on almost all concrete being placed today.

before vibrating

A foreman's life is a hectic one, with the many and varied problems that arise on even the best planned, most routine construction. It will be to his advantage, therefore, to spend a few moments analyzing the job at hand to assure the most economical and effective vibrating procedure.

First, read the manufacturer's instruction manual. Vibrators are built to withstand rugged duty; but even the best made tools in the world will develop troubles if used on work for which they were not designed or in

a manner contrary to recommendations. Vibrator manufacturers devote a great deal of research to improving both the design of their units and developing the best techniques for their use. New models often require different handling than did their predecessors. Take advantage of the manufacturer's know how by reading the manual supplied with your vibrator.

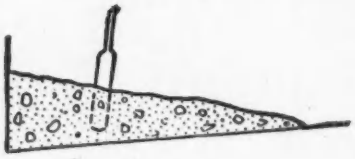
Check the number and condition of vibrators well in advance of placing concrete. The number of vibrators required for a particular job will vary with such matters as the type of construction, operating characteristics of the vibrators, slump of the mix, pouring schedule and skill of the operators. Remember, too, that vibrators will perform in accordance with their specifications only as long as they are kept in repair. Older, worn units should not be expected to operate as effectively as newer vibrators in better condition. Many contractors use their older models for standby duty. It is advisable to keep abreast of the types of vibrators that are continually being developed. A study of a new job, especially a large project, might indicate that an acquisition of new vibrators would prove profitable.

Examine formwork before concreting commences. Vibration places a strain on forms that must be considered. Screws or cement coated nails should be used to make up the formwork. Forms must be backed up sufficiently to avoid buckling or bulging. Joints must be especially tight. Even small openings will leak mortar during vibration and leave honeycomb.

Unless your crew is exceptionally experienced in the proper use of vibrators, it will prove worthwhile to instruct them. The proper use of a good vibrator is relatively simple but adherence to recommended practices will result in much better compacted concrete than if workers are left to their own resources.

Foremen should check on the slump of all concrete being placed to assure that no water is being added by workmen to "make it more workable." High slump concrete that is vibrated means future trouble because of segregation, low strengths, poor wearing surfaces and other ills. Also, proper placing techniques must be observed—concrete should not be dropped more than three feet, pushing by hand down insufficiently steep chutes must be avoided, and concrete should not be moved horizontally by the vibrator.

When Concrete Must Be Placed in a Sloping Lift



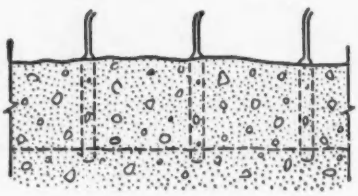
Correct

Start placing at bottom of slope so that compaction is increased by weight of newly added concrete. Vibration then consolidates the concrete.

Incorrect

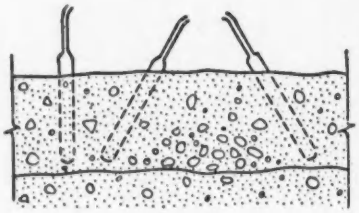
When placing concrete at top of slope, upper concrete tends to pull apart when vibrated below, because vibration starts downward flow.

Systematic Vibration of Each New Lift



Correct

Vertical penetration of vibrator a few inches into previous lift (which should not yet be rigid) at systematic regular intervals found to give adequate consolidation.



Incorrect

Haphazard random penetration of the vibrator at all angles and spacings without sufficient depth does not result in monolithic combination of the two layers.

while vibrating

Once concrete has been properly placed in well-constructed forms, the next important step is correct use of the vibrator. Each of the three types of vibrators—internal, form and surface—has its own handling technique.

When using an internal vibrator, the head should be inserted vertically in the concrete and then allowed to drop to an angle. This will result in the greatest area being vibrated. The entire head should be immersed to keep the bearings cool. After the concrete has been compacted, the head must be removed slowly to close the hole.

In deep sections, concrete is vibrated in lifts. The head should be inserted to within two inches of the bottom of the form for the first lift. It should be extended partially into the previous lift during vibration of each succeeding lift.

How long should vibration be continued? A common rule of thumb is 15 seconds per square foot of surface area. Naturally, this will be affected greatly by the vibrator used, concrete consistency and depth of the section or lift. A "feel" for the proper length of vibration is soon developed; but there are some signs that can usually be relied on to help gage the correct time to discontinue vibration in one spot. Compaction is ordinarily completed when the batch is level, coarse aggregate on the surface becomes uniformly coated with mortar, air bubbles have ceased coming to the surface and the sound of the vibrator has reached a steady pitch.

Vibrating screeds are used to strike off, consolidate, and give initial finish to flat sections of concrete. Remember that long screeds, although they cover a good deal of area, are heavy and difficult to vibrate at the correct frequency and amplitude. Edge forms must be well constructed to support the weight and drag of a vibrating screed. Some units have wheels for backing up to make a second pass. Before screeding it is often desirable to consolidate concrete close to the

This photo of a vibrating screed in action clearly demonstrates its effectiveness in simultaneously striking off, consolidating, and giving an initial finish to the concrete slab. The arrow highlights the workman with an internal vibrator, who has just consolidated the concrete at the form edge, the one area where the screed may not be able to do a thorough job.

forms with internal vibrators, since the screed may not do a thorough job in this critical area.

For most efficient use of personnel, concrete should be placed well ahead of the screed and raked to a height slightly above the forms to allow for settlement during vibration. The correct vibration rate and speed for moving can be judged by noting the surface of the concrete. Generally, the lower the slump and the longer the span, the slower should be the progress of the screed. Two passes are sometimes needed so that low spots can be filled and compacted. After screeding has been completed, the concrete is finished and cured in the conventional manner.

after vibrating

There are some precautions in the maintenance of vibrators that will pay handsome dividends in long life for your equipment if they are heeded. The first step in the proper care of vibrators is, again, to read carefully the manufacturer's instruction manual. He is vitally interested in keeping you happy with his product. If his instructions are followed, his equipment will usually prove effective and long lasting.

Naturally, not everything is covered in the manual but a little horse sense will go a long way in prolonging the life of vibrators. With electrical units, protect the leads from damage and soaking. Always store the equipment in a dry place, not under tarpaulins or other coverings which breed condensation. Rust and deterioration can be prevented by removing concrete from vibrators after each use and coating these tools with form oil.

On pneumatic units, always make sure that all lines are free of moisture before starting work. This can be done easily by running air through the lines with the vibrator disconnected. During rainy weather, protect the air filter to prevent water from being sucked in. After each use, the vibrator should be drained of condensed water and a few drops of S.A.E. 10 blown through the turbine. If the unit should freeze, do not attempt to start it by knocking it; damage to the bearings may occur.

Bearings are probably the parts of a vibrator most likely to give trouble if proper care is not exercised. Never allow the machine to run for long periods while out of the concrete since overheating is a likelihood. It is vital that the bearings be kept well greased. If the vibrator starts to act up by jumping and twisting out of grasp, one or more bearings are bad, there is a broken conductor in the electric cord or a loose electrical connection. The best procedure to follow is to check and repair vibrators at regular intervals, giving them the same careful preventive maintenance that you normally provide for trucks and other rolling equipment.

The development of the concept of concrete vibration and its surge to popularity has been a potent force in pushing quality of concrete to higher levels. Contractors can now consolidate low-slump, high-strength concrete with an ease unknown before the advent of vibration. END

CONCRETE CONSTRUCTION MAGAZINE

P.O. Box 444 Elmhurst, Illinois

TErrace 4-5110

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Where there's progress . . . there's POZZOLITH concrete

The men who designed and built these outstanding modern structures specified and used POZZOLITH to assure concrete of superior architectural and structural quality at lowest possible cost.

Over the years—in cities throughout the world—where careful attention is given to concrete performance and economics, the use of POZZOLITH is increasing steadily. Over 170 million cubic yards of POZZOLITH concrete have been placed to date . . . a significant proof-of-performance record.

For *your* job . . . with *your* materials—POZZOLITH concrete is best. Neither plain concrete nor concrete with any other admixture can match the results you'll get with today's POZZOLITH.

On any current or future concrete projects, the local Master Builders field man will welcome discussing your requirements. Call him in. He's at your service—and expertly assisted by the Master Builders research and engineering staff—unexcelled in the field of concrete technology. Write us for full information.

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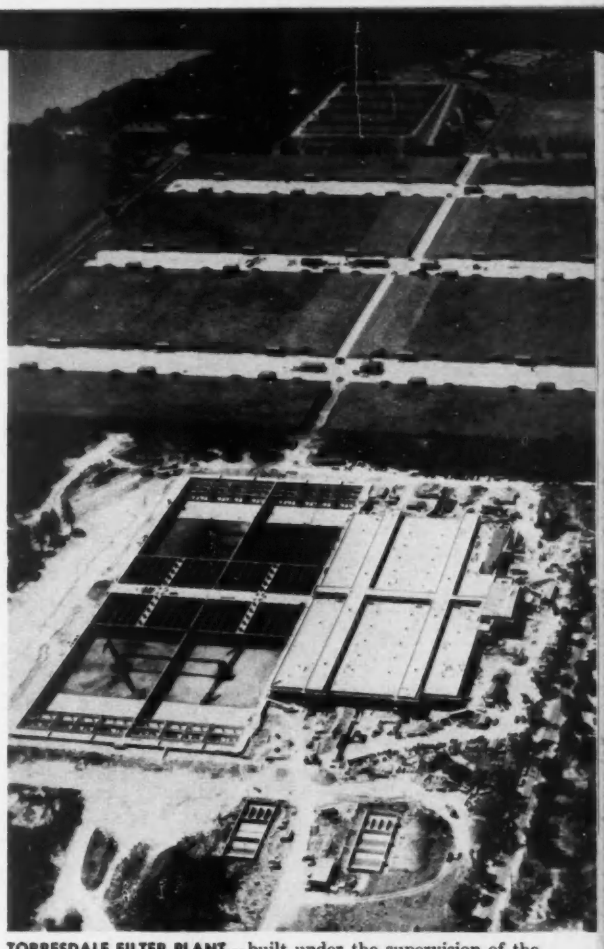


TORRESDALE FILTER PLANT—built under the supervision of the Philadelphia Water Dept., Commissioner & Chief Engineer, S. S. Baxter • Architect: Antrim & Etter, Philadelphia • Engineer: Morris Knowles, Inc., Pittsburgh • Contractors: McCloskey & Co. and Hughes-Foulkrod Co., both of Philadelphia • POZZOLITH Ready-Mixed Concrete: Liberty Corp. and The Warner Co., both of Philadelphia.

BENSON APARTMENTS—East & West • Architect: George S. Idell, F.A.I.A. • Engineer: Charles H. Wolf • General Contractor: Foxcroft Building Corp. • Concrete Contractor: Robert G. Hoffer Co., all of Philadelphia.

HEALTH SURVEY BUILDING—Lankenau Hospital • Architect: Vincent G. Kling, A.I.A. • Engineer: Chester I. Duncan & Son • Contractor: Nason & Cullen, Inc. • POZZOLITH Ready-Mixed Concrete: The Warner Co., all of Philadelphia.

GIMBELS UPPER DARBY STORE • Architect: Lathrop Douglass, New York • Engineer: Allabach & Rennis, Inc. • Contractor: Joseph R. Farrell, Inc. • POZZOLITH Ready-Mixed Concrete: The Warner Co., all of Philadelphia.

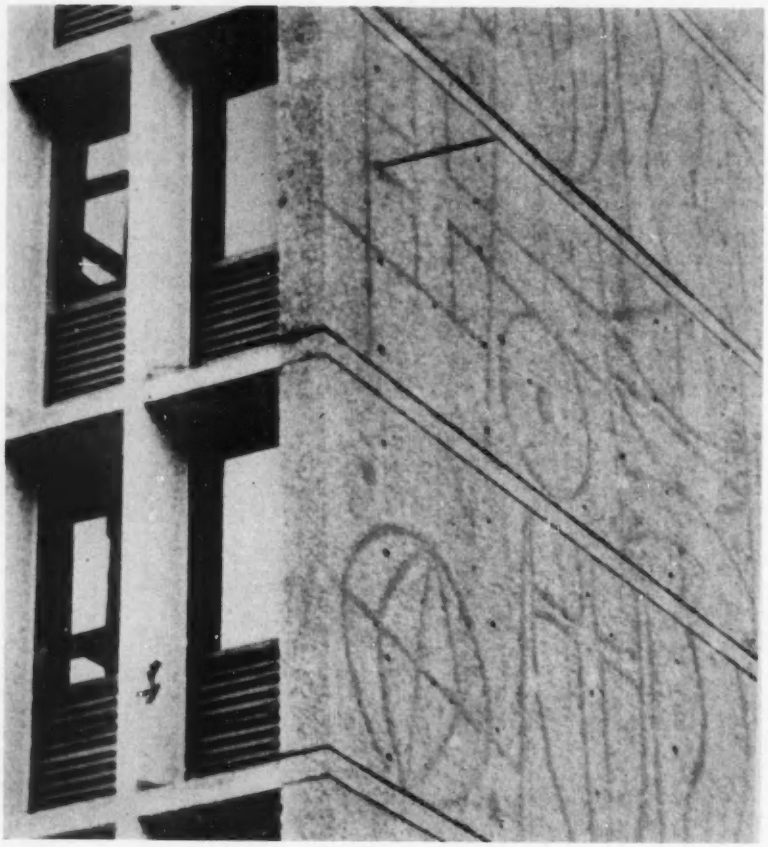
MASTER BUILDERS® POZZOLITH*

**POZZOLITH is a registered trademark of The Master Builders Co. for its concrete admixture to reduce water and control entrainment of air and rate of hardening.*

The Norwegian architect who developed this new surface finishing technique calls it . . .

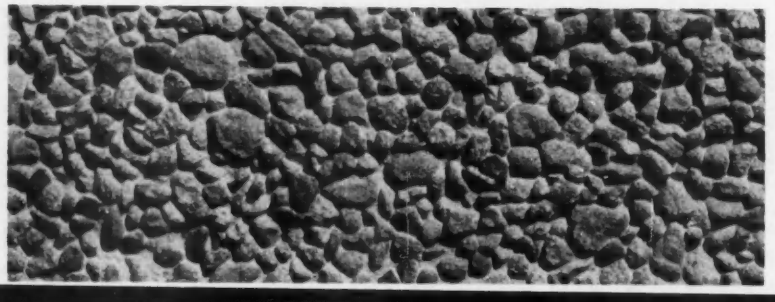
A NEW TECHNIQUE for obtaining an original finish on site-cast concrete has been developed by a Norwegian architect. The technique, which has been used by the architect for a number of small buildings in the past, was used extensively on a 17-story office block completed recently in Oslo. It might be described as a refinement of the intrusion method of placing concrete, coupled with sandblasting. The inventor calls the resulting textured surface "natural concrete."

NATURAL CONCRETE



Here is the end-wall of a 17-story office building in Oslo, Norway, showing clearly the design "painted" into the natural concrete by means of sandblasting over heavy rubber stencils.

Textured surface of natural concrete after normal sandblasting.

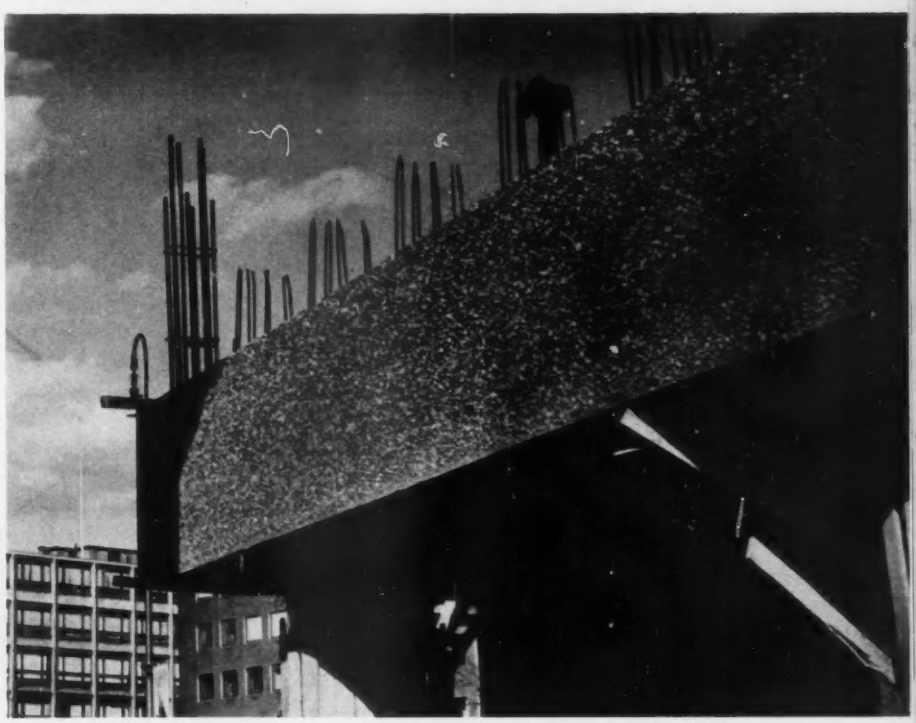


On the office block job forms were filled with an aggregate of washed pebbles, ranging in size from ⅜ to 1½ inches. Liquid mortar was then pumped into the mass through a series of 1-inch diameter pipes spaced at 2-foot 6-inch centers. The mortar was made up in batches, using 500 pounds of cement, 94 pounds of sand, 12½ pounds of a patent admixture to prevent water separation, 6 pounds of chalk filler, and 8½ gallons of water. The injection pipes were withdrawn as the form filled. The maximum height of each lift was 10 feet.

Forms were stripped after six to eight hours and the surface was immediately sandblasted. The patterned effect was created by the use of heavy rubber stencils. The surface has a unique character, different from that produced by sandblasting ordinary concrete, since only coarse aggregate is exposed. It is possible to create an almost unlimited range of pleasing finishes by varying the size, shape and color of the aggregate, by using a colored cement for the mortar, and by varying the amount of sandblasting. Some interesting results have been obtained by allowing an artist to use the blasting jet freely, without stencils, in the same way as a brush.

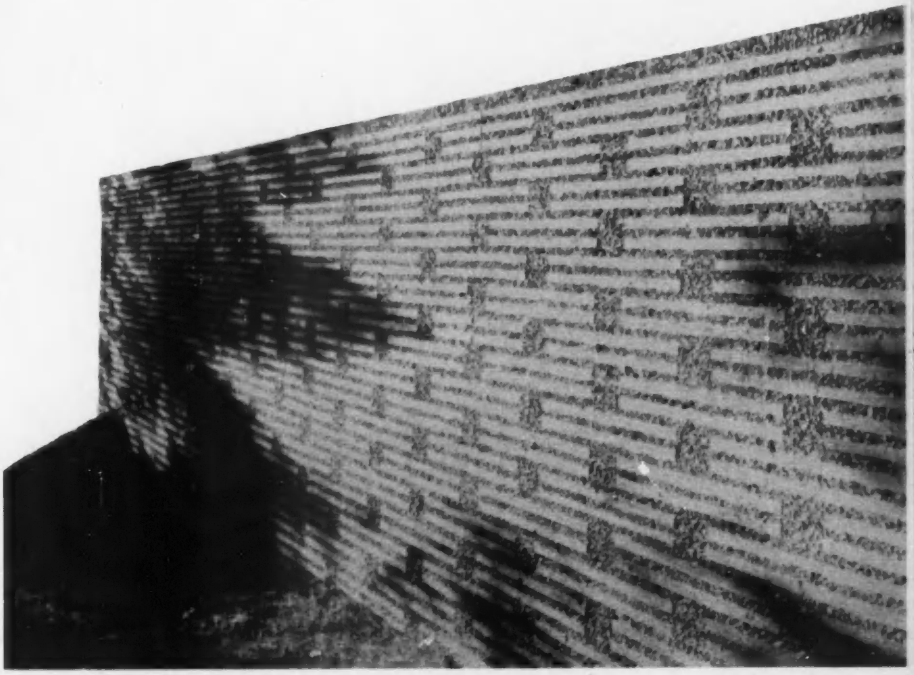
The technique allows a considerable saving in weight. The concrete produced in this manner normally has a strength of around 6,000 psi at 28 days. Other advantages are that joints between lifts are almost impossible to detect and creep is eliminated. If faults do occur they are easily corrected and concealed. The technique has proved highly competitive with traditional construction. END

(see opposite page for other finishes)



This striking edge beam for the office building consists of natural concrete cast with black cement.

The range of patterns, designs and textures is as unlimited as the imagination and patience of the people who do the work. This panel suggests a few possibilities.



This attractive wall finish for a villa was created by covering the concrete with a template so that only certain areas were affected by the sandblasting.

For letter-perfect concrete

To head the class in concrete construction you have to be a letterman today. The letters: WRDA and DAREX AEA . . . symbols of concrete quality!

REDUCE WATER with WRDA and gain all the benefits of a low water/cement ratio. You end the problems of watered-down concrete . . . yet mixes flow as smooth as country cream, compressive strengths zoom up as high as 25%.

ADD AIR with DAREX AEA, and a billion little air bubbles spread instantly through the mix, lubricating it for smoother, faster placement. As the concrete hardens, these bubbles guard against frost damage and cracking, even with repeated exposures to freezing and thawing.

You too can be a letterman. Use WRDA and DAREX AEA, a concrete combination that spells out a solid future.

W. R. GRACE & CO.
DEWEY AND ALMY
CHEMICAL DIVISION
Cambridge 40, Massachusetts
San Leandro, Calif. • Montreal 32, Canada

Placed inside formwork for casting structural concrete, these inflated rubber tubes will leave continuous cores to reduce weight and provide for running service lines. Removable steel bridges hold the tubes in place and prevent them from floating to the surface until the concrete takes on its initial set.

FORMING CORES IN CONCRETE WITH INFLATED RUBBER TUBES

ONCE UPON A TIME, the only way to form cores and ducts through concrete was to use steel or fabric forms and leave them in position. This was an expensive procedure, at best, and a complicated one when the runs were anything but straight. Today, light, reusable, highly flexible forms are available—made of rubber. Natural rubber can withstand repeated contact with green concrete; it needs no form oil, and a light brushing will remove any cement dust that might adhere to it. Some producers of rubber forms guarantee them for 100 uses; many contractors have gotten over a thousand uses from one length.

Both inflatable rubber tubes, like sausage-shaped balloons, and solid rectangular rubber forms are produced. The tubes come in standard diameters of ¾ to 12 inches, and in standard 60-foot lengths, but they can be made to special sizes. The pneumatic type of duct form is reinforced with a special cotton braid that has a diagonal mesh. This mesh insures even contraction when the tube is deflated. Each tube is fitted with a plug at one end and an ordinary air valve at the other. It can be inflated with a hand pump or a compressor.

These forms are being used for drainage and water supply systems, for heating, ventilation and air conditioning, as cable ducts, and for weight reduction in slabs and beams. They are especially handy for on-the-job work, where they can be brought to the site easily.

Normally the pneumatic duct tubes are inserted in the forms deflated. After the ends are secured, the tubes are inflated. Before the concrete is poured, it is usually necessary to hold the tubes in position with temporary locating devices. Otherwise they may be displaced as the concrete is poured. When the concrete has set, the tubes are deflated and withdrawn. They are then ready for immediate re-use.

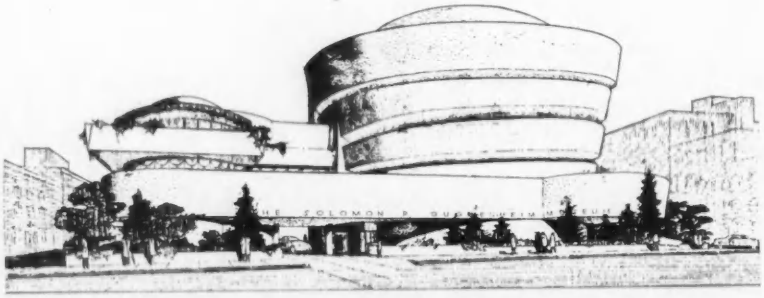
The solid rectangular tubes are inserted in the forms and made rigid by a mild steel bar placed through the center. When the concrete is cast, the bar is withdrawn first, and then the rubber form is removed.

A third type of rubber duct form, specially made for large diameter work, is made of standard rubberized canvas. Unlike the other tubes, this type doesn't expand on inflation. Otherwise, it has the same advantages. It is mainly used in sewer construction and for large industrial work, and is especially valuable for laying water and sewer mains over rough terrain.

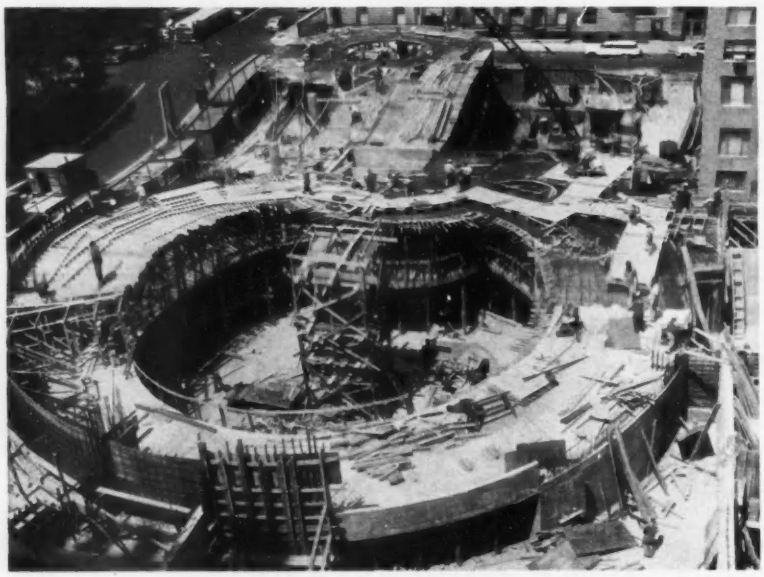
The rubber tubes offer special advantages in prestressed concrete construction, where they are used to form ducts for prestressing wire. The ducts, made of concrete, form a better bond with grout than they would with permanent duct forms of another material.

The rubber duct forms work equally well with every type of concrete. They can be used to advantage wherever ducts are necessary. New uses are constantly being found for them; they have been employed to form ventilator shafts in mines, for renovating old chimneys, and to introduce hot-air heating systems under concrete floors and driveways. Where a large mass of concrete is used (as in dam construction), ducts can be formed to introduce cold air or water to prevent excessive heating as it sets.

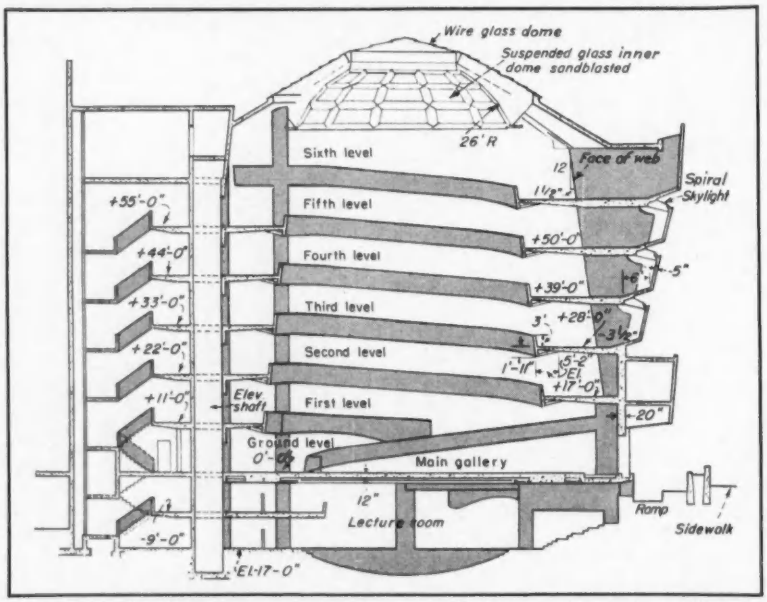
Tube type duct forms present no storage problems. After they have been withdrawn from the concrete they can be rolled up and housed in a very small space. The techniques for their use are simple and easily mastered. Inflation should be governed by the required diameter rather than by the pressure, since after continuous usage less pressure is necessary to obtain a given diameter. When used for forming a curved duct the inside radius of the tube should generally be not less than four times the diameter. In withdrawing tubes, usually done about 12 hours after the concrete is placed, deflation should not be brought about too suddenly. Occasional trouble with sticking can usually be relieved by reinflating. It is important to remember that the length of a particular tube will be decreased about 10 percent when it is inflated. END



GUGGENHEIM MUSEUM, Fifth Avenue at Central Park, New York.



A NAIL, driven into post at dead center of tower, was point from which angles and chords were established. Circular floor for administration building shows in background.



SIX LEVELS, BUT NO STEPS: Ramp widens from 96′ outside diameter at ground level to 125′ at top. It is actually a gigantic spring, stiffened, but not supported, by 10″ thick concrete webs, on 30° centers, which also serve as partitions between galleries. There are no conventional columns. Euclid Contracting Corp., N.Y.C., contractor.

Frank Lloyd Wright gives 'em helix

WHEN FRANK LLOYD WRIGHT designed the new Guggenheim Museum as a helix (spiral), he saved art lovers many steps. But he also gave the contractor a complex problem in concreting.

The exhibition gallery is an enclosed concrete ramp that spirals clockwise around a center court to the first level, then reverses to corkscrew counterclockwise for 5 more levels. This design enables visitors to ride the elevator up to any level and then view the exhibits in an easy downhill walk.

A total of 8,000 cu. yds. of reinforced concrete, of three different types, was required: Lightweight expanded-shale for ramp and floors, stone concrete for interior walls and 5″ Gunite for exterior walls. Design was 3,500 psi and 3″ to 4″ slump. Plasticizing and air-entraining admixtures improved workability, reduced heat development and retarded setting in 100° F. temperatures.

Daily pours varied from 40 to 200 cu. yds. Uniformity of batches was assured by using ready-mixed concrete, properly processed in truck mixers of certified design, capacity, mixing speed and water control accuracy.

It's not a particularly difficult task, but there

just isn't any substitute for doing a workmanlike job.

CAPPING TEST CYLINDERS

BY W. C. REID*

IT IS BOTH erroneous and costly to work on the assumption that capping concrete cylinders is a panacea; that it will cover up and compensate for sloppy workmanship and carelessness in the making and handling of the cylinders. Good cylinders are a prerequisite to good capping. Among the essential requirements are good concrete to begin with, careful molding and rodding, proper curing, and above all ends that are flat, smooth, square with the sides, and parallel with each other.

The cylinder has become the daily yardstick of quality, and production either continues or stops according to the results obtained when the cylinder is tested; therefore, in a sense, the cylinder is the most important product, and all the care and precision that can be put into it is more than justified. The delegation of the job of making and handling cylinders to unskilled personnel can be a costly mistake.

If capping is not for the purpose of covering up the results of carelessness, what is its purpose? ASTM C31-55 states in part: "The ends of all compression test specimens that are not plane within 0.002 inch shall be capped."

It is unlikely that even the most carefully cast cylinders will have ends that are flat within these limits; hence, capping is mandatory unless the ends are surfaced by accurate mechanical means. It should be noted that the specification refers only to flatness; it does not mention excessive roughness due to bad strike-off, or to bottoms bulged out due to careless rodding in cardboard or tin can molds, or to ends that are not square with the sides and parallel with each other for various reasons. The specification is simply a means of securing ends that have smooth and flat surfaces, on cylinders that are well and accurately made to begin with.

ASTM C31-55 also states in part: "Caps shall be as thin as is practicable, and shall not flow or crack when the specimen is tested."

Here again it is assumed that the ends will be flat, square, and parallel, because it is impossible to correct such errors without applying thick caps that are usually much thicker in some places than in others. Thin caps that are straightedge flat, of even thickness, and made of the proper material, are without doubt the best assurance of the highest possible test results. Heavy caps of uneven thickness, applied over ends that are not flat or square or parallel, and made of material of unknown characteristics, will combine to reject concrete that would be completely acceptable if the cylinder had been properly prepared and capped.

It is no longer practical or necessary to cap cylinders and then wait 18 to 24 hours before they are tested. Slow-setting capping compounds of cement and plaster have given way to fast-setting compounds that pour easily when heated and set almost instantly after pouring. A better understanding of the fast-setting compounds and the application technique will contribute toward uniformly better results. Fast-setting capping compounds usually have a sulphur base fortified with various additives that are intended to increase compressive strength and hardness and to extend the range of fluidity so that pouring is easier. The often-used term "sulphur caps" is completely misleading because straight sulphur should never be used under any circumstances. A good capping compound must of necessity have a compressive strength equal to, or preferably in excess of, that of the concrete to which it is applied. It can never be assumed that any material that can be heated and poured while hot is suitable. Good compounds should test not less than 5,000 psi when tested in the form of 2- by 2-inch cubes 30 minutes after pouring. Extra high strength compounds that will test above 10,000 psi will soon be available; their small extra cost will be cheap insurance against cap failure.

"Fast-setting" does not mean that a cylinder can be tested immediately after being capped. It does mean that the compound will set enough to permit the immediate removal of the cylinder from the capping fixture. For best results, capped cylinders should stand at least 30 minutes—preferably an hour—before being tested.

The salvage and re-use of broken caps from tested cylinders should be discontinued even though this was formerly considered to be good practice. There are indications that some compounds, due to re-heating or to contamination or to a combination of both, suffer a loss of both hardness and compressive strength; thus, it is possible that an originally acceptable compound can deteriorate to such an

*The author is with the Tester Division, Forney's Incorporated, New Castle, Pennsylvania.

extent that cap failure will result.

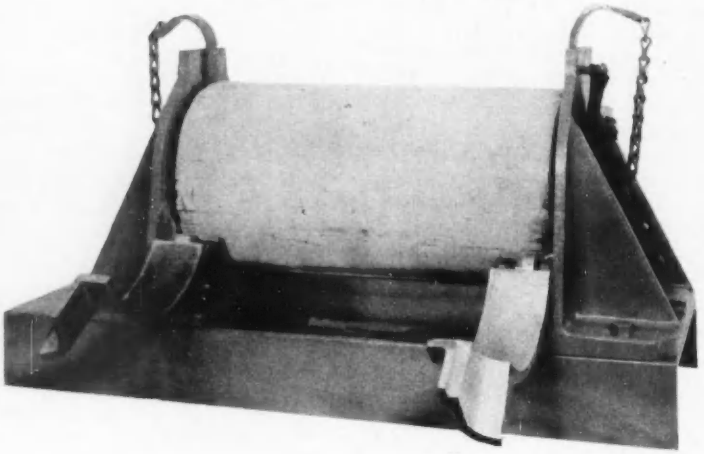
Capping material that will flow or compress under the normal testing pressures is ineffective in itself; in addition, if the caps are thicker on one side than the other, the machine platen will tilt as the compound compresses since it is mounted on a spherical seat and free to tilt in all directions. The result of this is that the load—which, for best results, should be applied parallel to the axis of the specimen—is suddenly applied diagonally, with resultant shear breaks often accompanied by low readings.

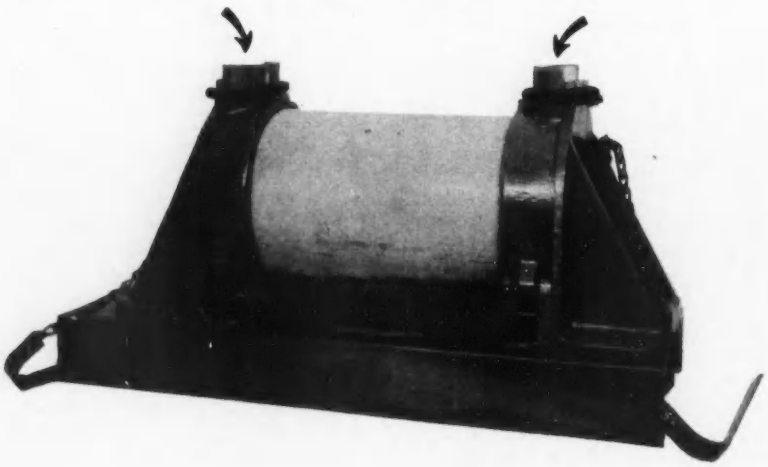
Pouring temperature of the compound is very important. All sulphur compounds have what can best be termed a range of fluidity, within which they have the same pouring characteristics as light oil; above and below this range, coagulation occurs and pouring becomes difficult. Good compounds have the widest range of fluidity which means in effect that they will not begin to set as soon as they are poured, and that the temperature control can be less precise. It should be very evident from the foregoing that the use of ordinary pots and kettles, heated in a hit or miss manner, can be a cause of trouble; thermostatically controlled electric pots with special sulphur-resistant linings are a necessity.

The most important factor in the pouring procedure is the degree of fluidity and this is especially true when horizontal fixtures are used. Air bubbles, which cannot escape because of premature setting or loss of fluidity, create voids beneath the surface and are one of the common causes of cap failure. Over-heated or under-heated compounds that are viscous instead of being liquid will render the very efficient horizontal capping fixtures ineffective because they set before they can fully penetrate the molding areas and before entrapped air can escape.

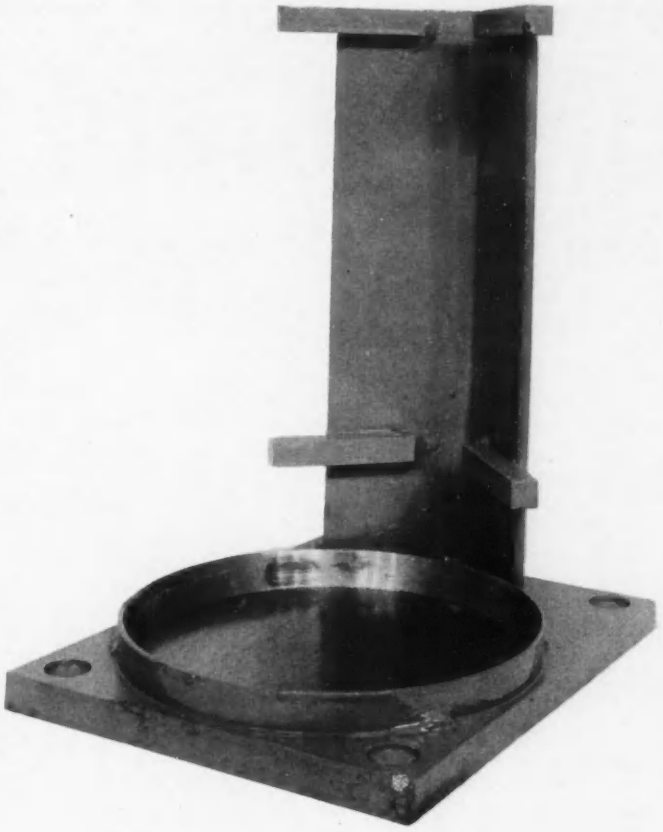
Capping should be a carefully controlled procedure and temperature is very important. Capping outdoors to avoid fumes, especially in cold weather, is a dangerous expedient. At pouring temperature capping compound is always above the boiling point of water, so that sudden contact with cold or wet surfaces will almost always result in imperfect caps. Cold fixtures, and cold or wet cylinders, can be counted on to produce bad caps; this is especially true of damp or wet cylinders which, when brought into contact with hot compound, will cause the formation of large voids beneath the surface of the caps or, at best, large exposed areas caused by entrapped vapor.

Capping fixtures, either vertical or horizontal, are a necessity. Their purpose is to locate the cylinder in such a manner that each cap is perfectly square with the sides of the cylinder and so that both caps are parallel with each other. The practice of capping without fixtures is effective only when the cylinders themselves are perfect, because without positive location from the walls of the cylinder, any degree of off-squareness or off-parallelism in the ends will be repeated in the caps. Vertical fixtures are designed so that the cylinder is pressed against vertically mounted vee blocks and lowered into a cavity filled with hot compound. After initial setting, the cylinder is lifted out and the procedure repeated on the other end. Horizontal fixtures locate both ends of the cylinder in radius blocks, with the cylinder in a horizontal position. Accurately machined and located angle plates equipped with molding collars form the ends, and feeler gages locate the cylinder so that the caps on each end will be of identical thickness. Hot compound is poured into the cavity at each end, without disturbing the cylinder.





In the photo above a test cylinder has been placed in a horizontal capper and feeler gauges placed between the ends and the angle plates. When the left hand block has been tightened the gauges are removed and the end clamps are closed and fastened together with wrap-around springs. Bottom view shows how the assembly looks when the clamps are fastened and ready for pouring. Arrows indicate openings in end clamps into which capping material is poured.



Vertical capping fixtures like this one are designed so that the cylinder is pressed against vertically mounted vee blocks and lowered into a cavity filled with hot compound. After the compound has attained its set the cylinder is lifted out and the procedure is repeated to cap the other end.

Bad caps are a common cause of specimen failure. Assuming that a material with adequate compressive strength is used, here are some of the conditions which should be avoided. Air pockets and voids beneath the surface will, if of any size, cause the load to be applied to only a percentage of the total area instead of to all of it; the result is usually a shear break and low reading. If there is any cause to suspect voids, tap the surface carefully before testing. Examine broken pieces for evidence of voids. Look for a spongy appearance which can be the result of too low or too high pouring temperature, contamination from the oil used in the fixture and on the ends of the cylinder, or from over-heating the compound. Examine fragments for indications of a wide variation in cap thickness, and look for indications that the cap failed to adhere to the end of the cylinder. The practice of oiling the end of the cylinder to facilitate the removal of the capping material after the specimen has been broken was suggested when the salvage of capping material was acceptable. Too much oil causes the cap to fail to adhere, and in most cases it will bulge outward. Avoid oiling the ends of the cylinder and do not attempt to reuse the compound. Before a capped specimen is tested, put a straightedge across each end and if the cap is not absolutely flat, break it off and apply a new cap.

All of the foregoing should not leave the impression that making cylinders and capping them is a complicated and costly procedure. On the contrary, the reverse is true. It is actually easier and much less costly to make good cylinders and to apply good caps because the combination results in optimum test results, and costly shutdowns resulting from needless sub-standard test results will be avoided. END

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- **motor-in-head design—cooled by surrounding concrete**
- **easily handled by *one man*—no cumbersome flexible shaft and motor**
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Model UCV-9

SPECIFICATIONS
MODEL UCV-9

HEAD—2⅜ in. diameter; 14 in. long; weight, 11 lbs.

MOTOR—universal 110 volt ac-dc type; heavy duty brush rigging and commutator; wound armature runs on 2 shielded high speed ball bearings; 10,000 rpm

ECCENTRIC—one-piece alloy steel; designed to match motor characteristics; runs on 2 shielded high speed ball bearings

CABLE—standard 10 ft. operating hose; heavy duty concrete-proof operating switch; 50 ft. rubber-covered 3 conductor cable (3rd wire ground); male 3-prong plug with female connector for attachment to extension cord.

Maginniss Uni-lectric universal concrete vibrators handle medium or high slump concrete effectively. They use on-the-site power (including the dc output of Maginniss Hi-lectric generators, if desired)—are easily carried from job to job. Their cost is low! And, manufactured by the same Maginniss craftsmen who produce heavy duty Hi-lectric vibrators, Uni-lectrics will deliver a maximum amount of dependable service.

Larger contractors will find the Uni-lectric a handy companion for their heavy duty Hi-lectric concrete vibrators—perfect for occasional small pours on bigger jobs.

Ask your Maginniss distributor to show you how the Uni-lectric fits your operation—he'll be glad to demonstrate. *You'll find him listed in the YELLOW PAGES under "Contractors' Equipment"*

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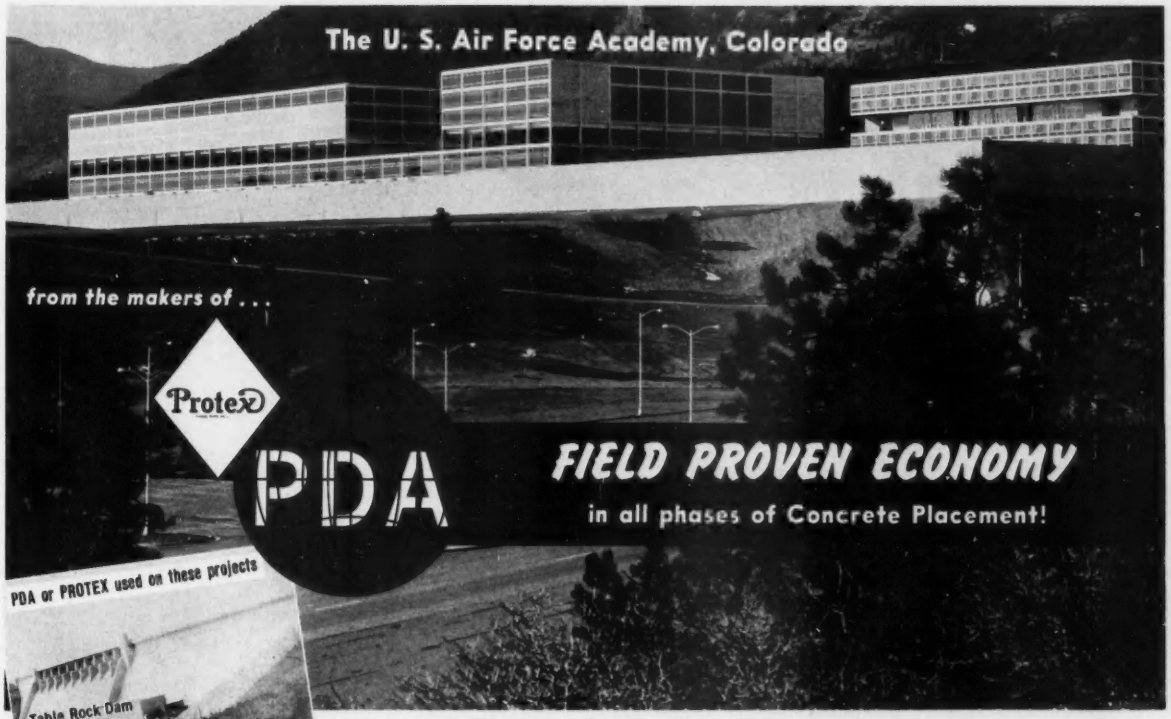

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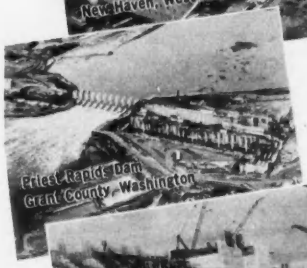

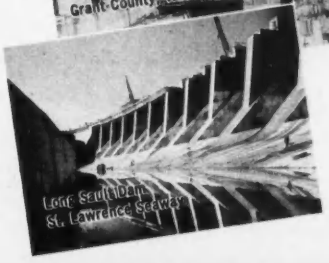

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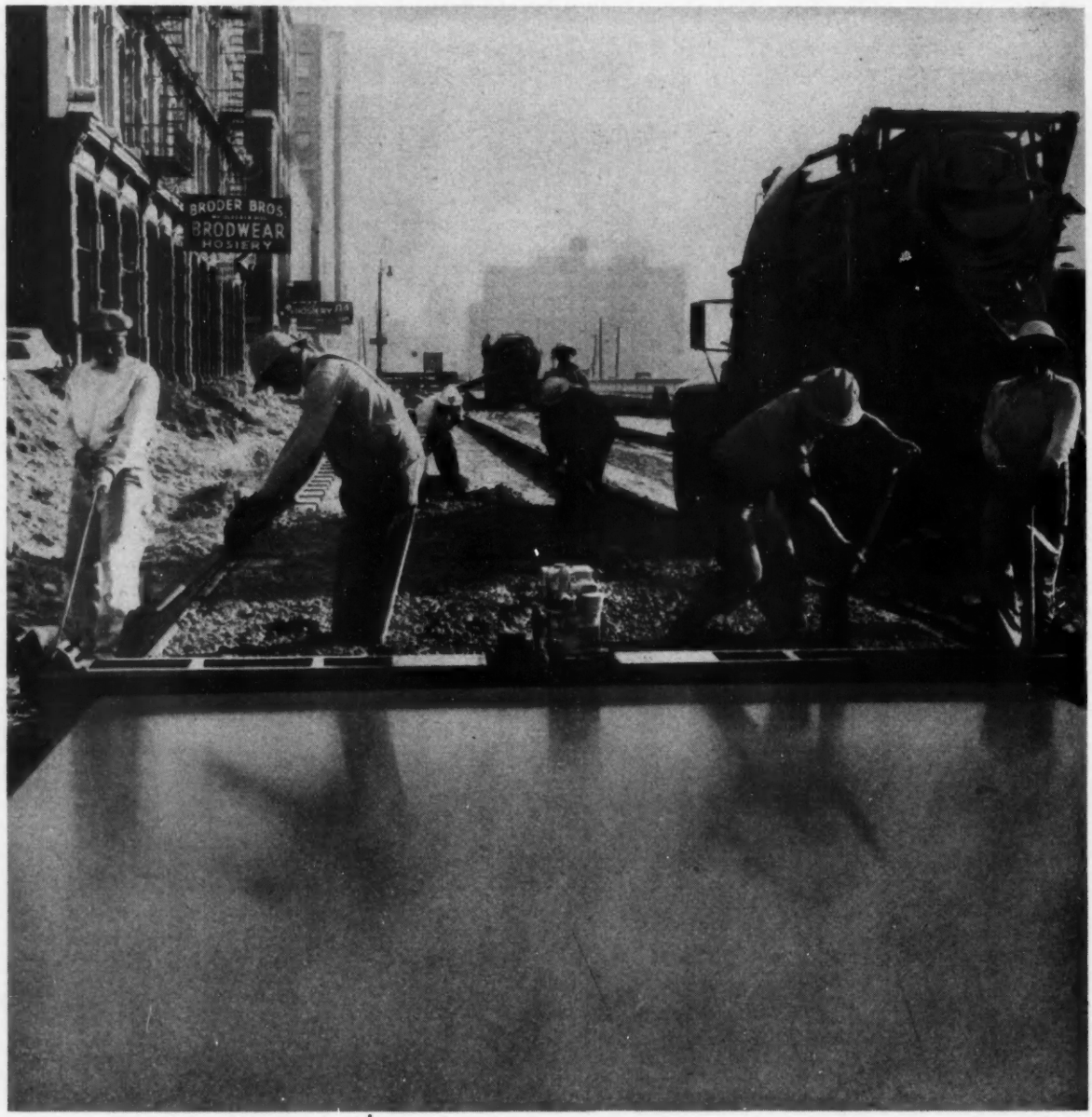

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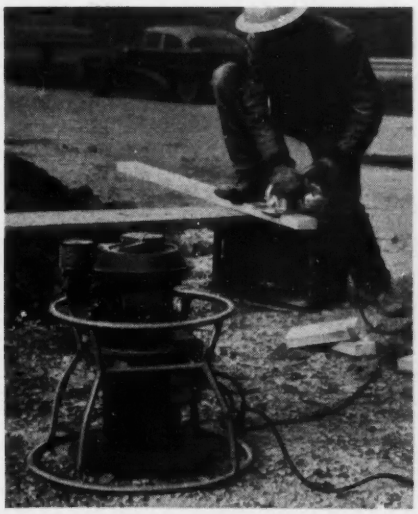

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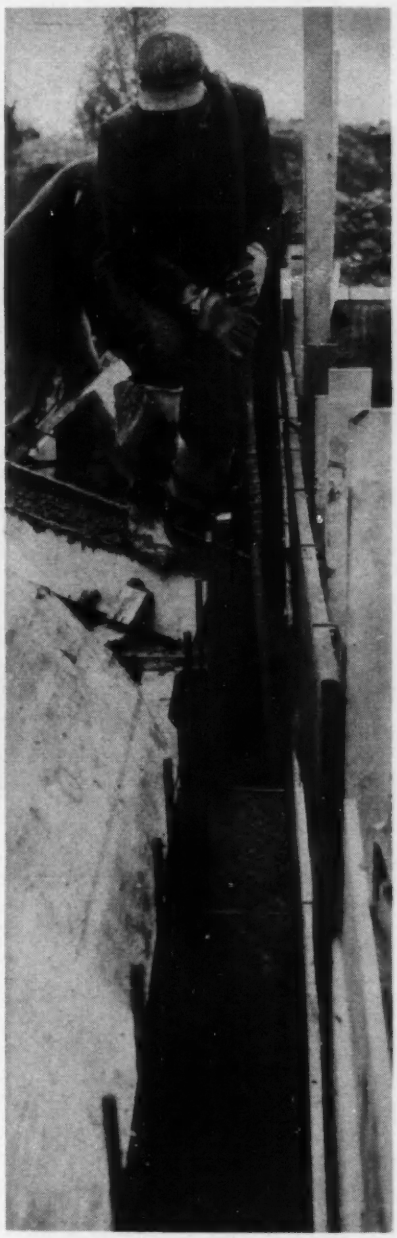


Motor-in-Head Vibrator. Plug into any electric current source (AC or DC), including generators. One man can transport, set-up and operate vibrator. Motor-in-head delivers 15,000 V.P.M. Thor CV2 Vibrators available in 10, 20, 30, 40 and 50-foot operator hose lengths.

We are a nation of small businesses, and the construction industry in particular boasts many a small contractor who had the courage and stamina to step out on his own. Many of those who weathered the competitive storm have told their stories to the author of this article. Out of their experience has come valuable knowledge of . . .

The Pitfalls of a Small Business

BY W. H. KUEHN*

ONE HALF OF ALL the businesses in this country are worth less than $10,000. Only 5 per cent are worth over $125,000. Among the smaller concerns today close to 20 per cent will have discontinued by the end of one year. With high hopes, new businesses will come along, but many of these, too, will fade in time.

There are two kinds of failures: the kind that ends up in court with loss to creditors; and the more common, and important, kind where creditors don't suffer but a man loses everything he owns to pay off his debts. No matter how the end comes about, the signs of failure are there almost from the start. They can be recognized, traced, and often avoided. It is the purpose of this article first to point out the major pitfalls as reported in actual cases to Dun & Bradstreet, and second to offer some suggestions as to how these pitfalls may be avoided.

THE PITFALLS

The FIRST is lack of experience. It is more or less taken for granted that you have to know the building trades in order to be a building contractor. But operating a successful business is more complex. You have to know selling, or how to get customers. You have to know how to buy machinery and equipment. And you have to know how to handle your finances.

For example, listen to this wholesaler of hardware whose experience and knowledge of selling were conditioned by the days of easy selling: "I started this business immediately after the second World War, in a sellers market. First difficulty I encountered, and I almost floundered, was the conversion to the buyers market. I remember right after the transition to the competitive type of marketing, I couldn't understand why customers would enter my store, stand around for a few minutes and then leave. It was quite a while before I learned that you had to adopt a more positive, aggressive attitude and go to the customer. As soon as I started

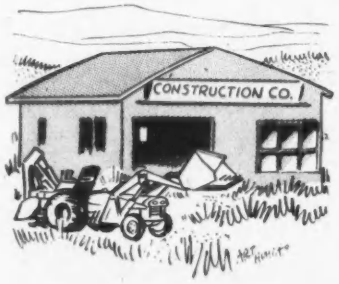
greeting the man when he came in the door, showing him quality merchandise and attempting to sell him, I was once more doing OK."

The SECOND pitfall is lack of money. Are you operating on a capital deficiency? The best way to find out is to figure the amount of capital you *should be* operating on step by step:

First, figure your expenses: how much for rent, equipment, materials, advertising, and a salary for yourself and those you employ? Next, what sales do you need to cover those expenses? If you want to do more than just break even, how many more sales do you need to see a profit? Now, when you know what sales you need, you can begin asking yourself what capital is needed to produce this volume of sales.

Sometimes capital deficiencies can be overcome by resorting to borrowing from banks and friends with the resulting loss of profits through interest rates. It could take many years to break even this way. Better ways of solving the problem of inadequate capital are through sheer drive—plain hard work around the clock until you are able to afford to hire help. Or cut down on personal living expenses until the business is stable. And finally, start small and build volume only as capital is accumulated.

The THIRD pitfall is the wrong location. In the operation of any business, the question of location is important. The cost of that location is rent. Although the usual advice is don't pay too much for rent, many businessmen stub their toes because they don't pay enough rent. The first thing to consider in a location is convenience to your customers; the second is room to expand.



*Director of Education, Dun & Bradstreet, Inc.

The FOURTH pitfall is too much capital going into fixed assets. Let's take an example. A firm has working capital of $100,000 and a nice plant worth $100,000 clear—beautiful situation. But so many jobs are coming in, the management thinks they ought to expand. So a second plant is purchased for $100,000 and mortgaged for $50,000. What happens? Working capital goes down immediately to $50,000. And there are now two plants to operate with $50,000, whereas before there was one plant to keep going with $100,000. There are additional employees. When this second plant was built, working capital should have gone up closer to $200,000 than down to $50,000.

The FIFTH pitfall is poor credit policies. A credit business can be handled successfully, but before the decision is made to extend credit, ask yourself two questions: Do I have enough capital? Roughly an additional capital investment equal to 1½ months' credit sales is needed if selling terms are 30 days. The second question is: Do I know how to collect? Remember that judgment is needed in opening a credit account and firm persistence in getting the money is a must. Some people just don't have the skill or temperament to collect.

The SIXTH pitfall is taking too much money out for yourself. In the early stages of a new business, an owner and his family tighten up and personal expenses are kept down as long as profits are low. This is not always done, however, when the necessity arises later on. An example cited by one of our Dun & Bradstreet reporters is that of a man who inherited a sound and old business. Then he hit a bad period when his net worth declined and his debt went up. His withdrawals during the bad years remained the same as he had taken out all along. No attempt was made to cut expenses. (MORE)

The SEVENTH pitfall is unplanned expansion. Expansion can be of two kinds—from within as a steady growth in sales and profits, or from without by acquisition of new units. This second type of expansion must be carefully planned. Generally, additional capital is needed, but more important, the ability to manage people is required. A man who has been operating a small business with all activities and decisions under his personal control may not find it easy to give up some of his responsibilities to others. Indeed, he may not know how to teach others to take over his work.

The EIGHTH and last pitfall is having the wrong attitude. It goes without saying that a man who operates his own business must have a spirit of courage and determination. But sometimes this develops into the feeling that "I'm the boss now and I can take off any time I want." Lack of plain hard work and attention to the business can be the undoing of a good concern. A man can work hard and still be lazy if he doesn't exert a little more effort than the job actually requires. Here is a brief excerpt from a case history reported to Dun & Bradstreet by a contract hauler: "I was employed as a laborer on a construction gang one time, back in the mid-30's, pushing a wheelbarrow. I noticed that one of the other men, also a wheelbarrow pusher, did everything on a dead run. Loaded or empty his wheelbarrow was always going at top speed. Later on, I found out this man was used as a pace setter for the crew, and was paid extra. Ever since then, figuratively speaking, I have been pushing my wheelbarrow at top speed."

Another danger spot to watch in your attitude is: Are you too involved in social and other outside activities to devote the proper time to your business?

SOME SUGGESTIONS FOR AVOIDING PITFALLS

First, recognize your limitations. Don't try to do more than your capital or experience will carry. Sometimes this may mean turning down a job, but it will save your business from getting beyond its depth.

After recognizing your limitations, *plan.* Don't just drift into things, but plan ahead. It doesn't hurt to actually write policy down on a piece of paper. You write, "My policy regarding the kind of jobs I wish to take shall be as follows . . ."

Keep enough records, but don't spend all your time working with them. It is surprising how many people just don't know how. When our reporters talk to business people about their early days it is surprising the number who say: "If I were starting again, I would learn some bookkeeping or accounting. It's necessary to learn from figures what's going on."

Watch the balance sheet, not just the profits. Examine your liabilities one year, then look at them the next year and ask, "Am I going too far into debt? How do I stand debt-wise, compared with what I've got in the business?" Look at the trend in working capital. Is it up or down? Compare net worth. Decide not only did you make more money than last year but also whether you are sounder this year than last.

Investigate first, not after. The incentive to make money is strong enough that all of us have the tendency to go ahead and act first, then look afterwards. When a job comes along with the promise of a good profit, take time to make a thorough investigation of all the problems and possible difficulties involved.

Get a good banking connection and good suppliers. Both banks and suppliers can help a small business in many ways. The banker sees many enterprises come and go. A line of credit used judiciously is a very helpful thing.

Learn as much as you can. You may know the product or service you sell thoroughly. But you should know business management and accounting too. Business clinics help. Meetings with people in your line are helpful, as is membership in a local or national association.

Some times when you don't know, it's best to seek professional help. Go to an accountant. He has a chance to view other businesses. If you plan to expand, ask if he thinks you have the capital to open a new plant. Or ask him to work out on paper some of the financial details of a possible expansion. It's worth the money to know what lies ahead.

Plan, keep records and look at them (especially the balance sheet), investigate, overcome limitations by studying, get professionals and suppliers to help you. Above all, fit the operation to your ability.

You can't avoid all pitfalls, but by knowing them and looking ahead you can minimize them. END

Officers and directors of NCCA attending the second annual convention are shown here as they greeted delegates at the opening session. From left to right, *Harold Allen, Henry Myers, Bob Burns, E. Ray Freeman, Phil Hoerr, H. J. Bjornsen, Troy Pauley, Bert Carey, H. S. Carelli and Fred Finomore.* Not shown, but also in attendance, were *Elbert F. Lewis and Carl Narducci.*

concrete contractors hold second national convention

Members of the National Concrete Contractors Association met at Dallas, Texas, for their second annual convention early in February. Important business included the selection of standing committees to report on methods exchange between chapters, membership, labor relations, credentials and dues, and public relations, as well as a nominating committee to present four candidates for election as directors.

Re-elected to two-year terms as directors of the association were Harold W. Allen, president of Allen Cement Contractors of Dayton, Ohio; H. J. Bjornsen, president of Bjornsen Construction Company, Cedar Rapids, Iowa; H.S.Carelli, partner in the Carelli Concrete Construction Company of Denver; and Allen Yost, owner of the firm bearing his name in Sterling, Colorado. Wade Palmes, a partner in C & W Concrete Contractors of Decatur, Georgia, was elected to fill the balance of the unexpired term of Charles Prosser of Los Angeles.

Technical sessions of the convention proved popular with convention delegates, who heard some of the leading figures in the concrete world speaking on important phases of placing and curing concrete.

"How to Place Better Residential Slabs" was the topic for a panel moderated by William H. Kappel of the University of Illinois Small Homes Council. Members of the panel were H. E. Nasse, assistant sales manager of the Visqueen Corporation, Chicago; Perry H. Petersen, director of engineering, The Master Builders Company, Cleveland; and W. Dunlap of the Dow Chemical Company, Midland, Mich.

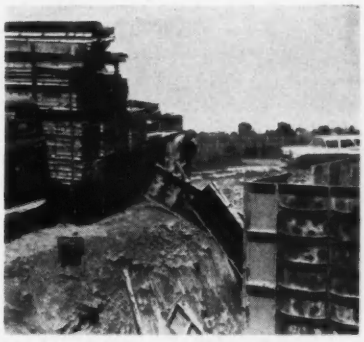
Mr. Kappel opened the discussion by outlining the various types of slab construction, stressing what is considered good construction versus what is bad. He pointed out that a floating slab was much more economical than the conventional wall-and-footing with separate floor slab, except, of course, where extreme frost conditions exist. Mr. Petersen spoke on the design mix and the reinforcing and placing of concrete for slab construction. Mr. Dunlap illustrated how insulation is used under various conditions to combat the effects of frost upon concrete. Mr. Nasse explained the effects of vapor and surface water upon concrete slabs.

"Unusual Soil Conditions in the Texas Area" was the subject of a talk presented by Professor C. Smith of Southern Methodist University.

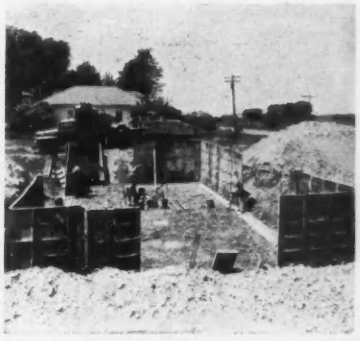
At the closing session of the convention, delegates chose Cleveland, Ohio, as the site of the third annual convention to be held in 1960. The Cleveland chapter of NCCA will act as host to the membership. END

9 to 11 House Foundations Every Week with 5000 sq. ft. of SYMONS Steel-Ply Forms

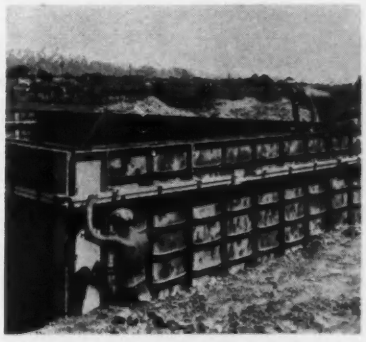
Pouring 9 to 11 house foundations a week is a regular occurrence in the sparsely populated area of Logan, Utah. In fact, Morris J. Smith, the concrete contractor, and his crew with about 5,000 square feet of Symons Steel-Ply Forms have poured more than 400 foundations in 2 years. The plywood has not been turned and is still good for many more pours. Here is a typical example of how Smith achieves speed and economy in his concrete work:



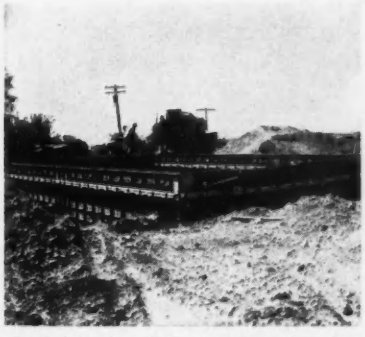
It's 9:00 A.M. . . . Flatbed trucks back on to job. Compartments built on the trucks, separate fillers and panels. Fillers are loaded on the front end and the full size panels are loaded on the back. The truck is used as a warehouse, with each filler and panel having its own specific place. This helps to speed loading and unloading.



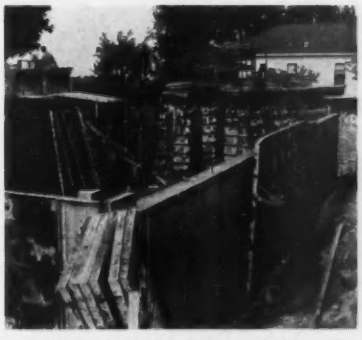
Setting up Four Corners Starts Erection. Each outside corner is erected by one man. The men do not work in pairs . . . each works singly. The outside walls are erected first. By starting at the corners, the men meet in the middle, insert the size filler it takes to finish the foundation . . . forming is completed and ready for pouring.



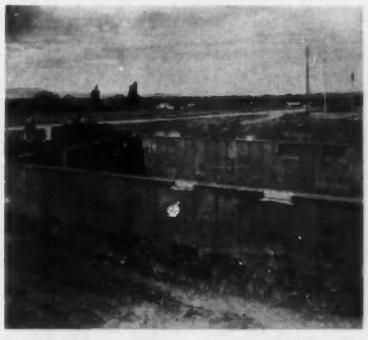
Double 2 x 4 Walers for Alignment. Walers are placed 18" from the top of the 8' panels. There are no walers at the bottom. Waler plates are hung on cross members which helps speed erection. When stripping the forms, buckets are placed close at hand for holding the wedges, waler plates, connecting bolts.



11:00 A.M. Foundation Ready to Pour. Yes, just 10 man-hours to set up 2,000 square feet of forming. And it's an everyday occurrence. Paying local rates ($3.00 an hour) cost of erecting is 1½c a square foot. Stripping in 8 man-hours costs about 1c a square foot. Pouring takes about 6 man-hours.



Stripping and Loading Forms and Fillers. Two men on the outside wall, two men on the inside wall stripping the forms. One man on the flatbed truck loading in a neat, orderly manner. This eliminates stacking, restacking and piling . . . all extra handling operations which cost money. Forms are cleaned before loading on trucks.



24 Man-Hours Later . . . Completed Foundation. Morris J. Smith is an excellent example of a concrete contractor who has put the Symons Forming System to work efficiently and profitably. 9 to 11 house foundations, similar to the one shown above, are poured every week by Mr. Smith and his crew.

concrete dome roofs London planetarium

Despite its odd shape this structure is even more remarkable as an example of the uninhibited work being done with concrete overseas. Opened recently in London by Madame Tussaud's Ltd., proprietors of the famous wax works, this dome-shaped building houses a Zeiss planetarium—the first in the British Commonwealth.

It consists of reinforced concrete ribs at 30-degree spacings supporting a double skin of concrete slabs. The ribs of the dome were precast in sections and tied together with site-cast circumferential beams to form a structural net. The 3-inch thick slabs curve in one direction only and fit together with a simple lap joint, spanning between ledges on the circumferential beams.

A 12-foot diameter ring beam and slab cap the structure. The dome was covered with a layer of cork slabs, bedded in bitumen, and sheathed with light-gage copper sheets.

You Get a Batch of Extra Benefits with Permalite®

Lightweight Insulating Concrete

GREATER STRENGTH than any other concrete in the same weight class—compressive strengths of 480 psi or more with a 1:4 mix.

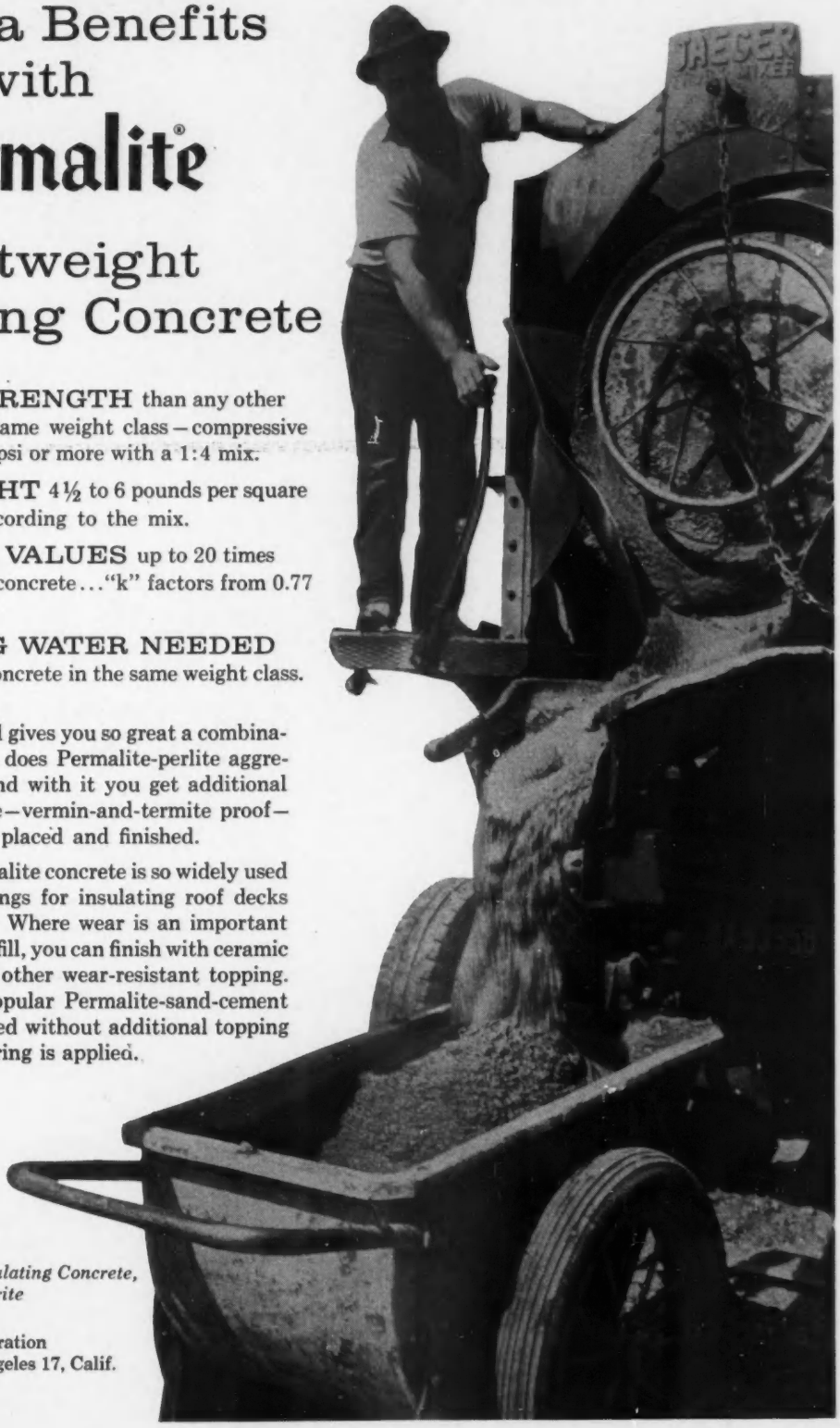
LIGHT WEIGHT 4½ to 6 pounds per square foot 2" thick according to the mix.

INSULATING VALUES up to 20 times that of ordinary concrete..."k" factors from 0.77 to 0.58.

LESS MIXING WATER NEEDED than any other concrete in the same weight class.

No other material gives you so great a combination of values as does Permalite-perlite aggregate concrete. And with it you get additional benefits—fire-safe—vermin-and-termite proof—can't rot—easily placed and finished.

That's why Permalite concrete is so widely used in today's buildings for insulating roof decks and for floor fill. Where wear is an important factor, as in floor fill, you can finish with ceramic tile, terrazzo, or other wear-resistant topping. Or one of the popular Permalite-sand-cement mixes may be used without additional topping before floor covering is applied.



For the complete story on Permalite Lightweight Insulating Concrete, see your Sweet's File, or write

Perlite Department,
Great Lakes Carbon Corporation
612 So. Flower St., Los Angeles 17, Calif.

Dodson's Digest

Dial D for Dodson

"I'm in trouble! Can you come over right away?" It was Hal Jasper's voice on the phone—a pitch higher than usual and somewhat frantic. Time: 3:00 o'clock in the morning on a Thursday about a month ago. Mission: Rout me out of bed to help out on a grain-elevator job his contracting firm was pouring.

If I said I'd leaped out of the sack wide awake and alert, eager to meet any challenge, I'd be kidding myself. I only remember stumbling into some clothes and heading the car toward the address he'd stammered out.

When I arrived at the floodlighted job site, it was starting to snow, and I noticed the air had a bite it didn't have the evening before. I saw Hal directing some ready-mix trucks toward a crane, so I hurried over.

"Oh, hello, Dod," he said absently, "have you seen my——"

"Don't tell me. I know your problem," I interrupted reassuringly. "It's a continuous pour and the temperature dropped on you. You'd better call the ready-mix company and tell them to add Calcium Chloride right away. It'll speed setting, cut your protection period in half! More important, your concrete will flow faster, fill the forms quicker, and——"

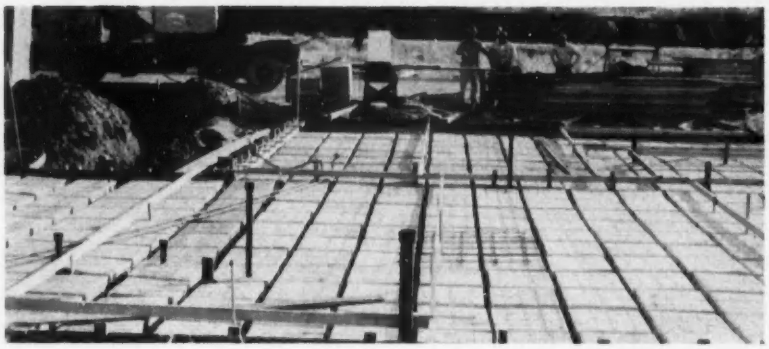
"I know," he broke in edgily. "Called 'em hours ago. You know I'm sold on Calcium Chloride."

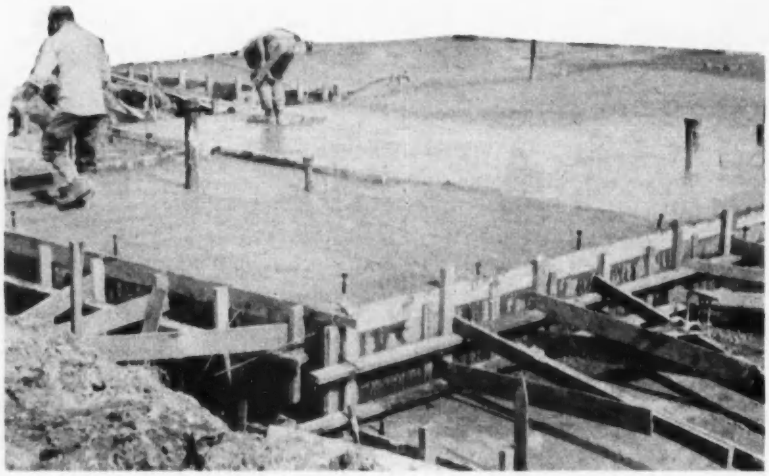
I was flabbergasted. "Then why did you arouse me from a sound sleep in the middle of the night when——"

"YOU?" Hal's face broke into a sheepish grin. "I've been waiting for my day foreman. Must have misdialed. You see, the night man hurt his foot, and——"

— L. D. Dodson

P.S. If you'd like to pore over some enlightening facts on improving concrete, write for our booklet, "How To Make Better Concrete Products and Ready Mix." *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*





void boxes used for "floating" home foundation

Corrugated void boxes for poured concrete foundations and flooring have been used for the first time in California home construction on a San Francisco Bay home designed by architect Joseph Esherick. The boxes have been used extensively in industrial and public concrete construction but their application in the Belvedere Lagoon home is new and is believed to mark their first use in foundations of single dwelling units.

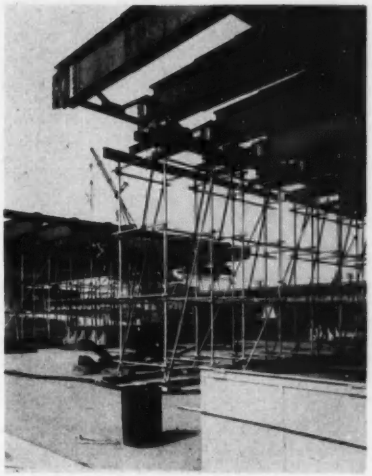
The interior of the box has been reinforced with an "egg crate" of crossed and interlocked sections of paperboard. A water resistant adhesive was used in forming the void boxes, to provide protection against distortion from moisture.

The boxes were spaced three inches apart on a thin, graded bed of sand, with half inch reinforcing steel placed between the boxes and slightly above the level of the sand.

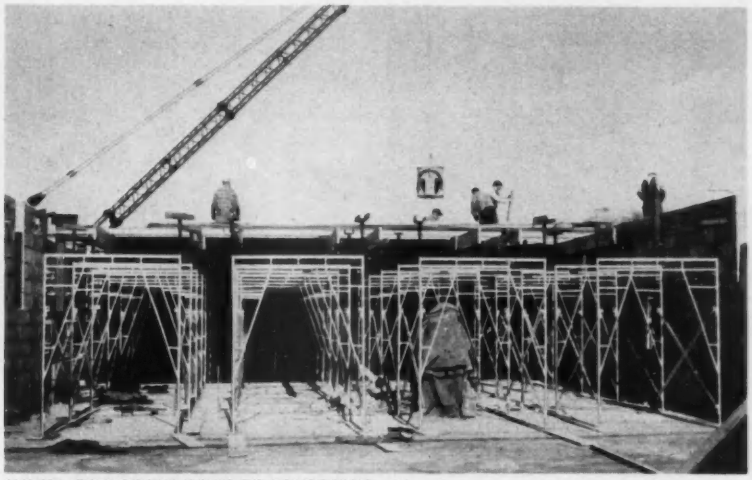
Additional slab reinforcement, consisting of 6-inch wire mesh, was placed across the top of the boxes before the concrete was poured between and over the boxes to a depth of three inches above the tops. The air filled voids created in the slab by the paperboard boxes produced a foundation of minimum weight but eighteen inches deep.

The depth of the slab, together with the reinforcement grid within it, produced a foundation of great strength and the voids assured its proper functioning as a true "floating" foundation. This was also encouraged by the removal from beneath the house of earth having about the same weight as the house itself.

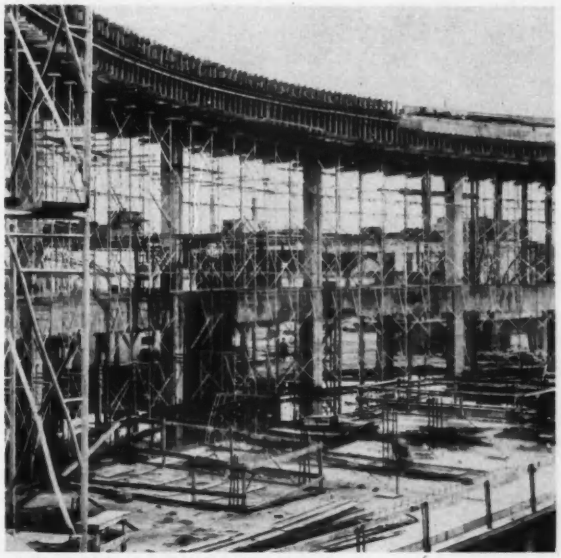
Shoring Methods . . . by Patent Scaffolding Co.



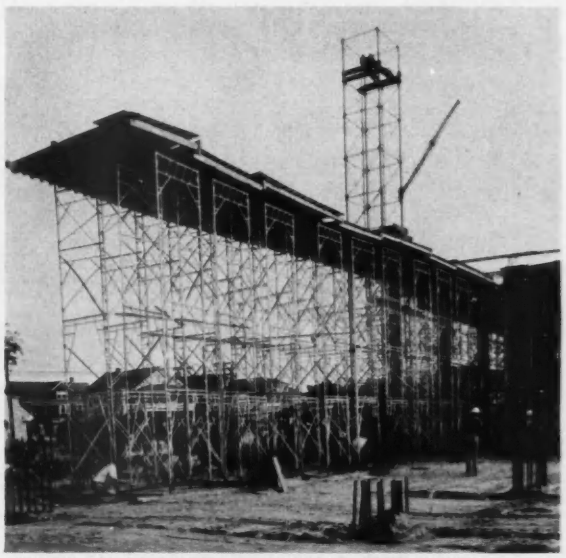
CUTS COSTS 20%—"TubeLox"® Steel Shoring "towers" permit setting several dozen steel girders a day on overpass in downtown St. Louis. Instead of setting and riveting one girder at a time, thereby making iron workers dependent upon movement of cranes, St. Louis Steel Erection Co. keeps workers on the job, eliminates lost motion, and cuts working days by 20%.



NEAT, QUICK ROOF SLAB SHORING—Simple, easy-to-erect frames of "Trouble Saver"® Sectional Steel Shoring are rapidly set in place to support the formwork for the slab roof of the new Southwood Acres School, Thompsonville, Conn. Only 700 6'6"-high frames are required. Spaced 7' apart with 3' to 4' spacing between rows, these "Trouble Saver" Shoring frames adequately support all the load encountered. Notice how the free standing sections are neatly arranged ready for the placement of forming lumber. U-heads placed in the tops of the scaffolding frames are designed to hold the wood stringers. 20" adjustable leg attachments provide the precision shoring height required. Detailed layouts, supplied by PS Co., make assembly on the job site quick and easy. John Romano Contractors, general contractor.



SUPPORTS 3165 LBS. PER FOOT—Here, "Trouble Saver" Sectional Steel Shoring components are shown arranged to support a 242' diameter concrete beam, 47' above ground. Beam is 5'8" wide, with irregular depth to 4'6". While the height to which this shoring is erected is interesting, the major importance is the fact that it is assembled to carry a load of 3165 lbs. per lineal foot of beam. Utica (NY) Memorial Auditorium. Sovereign Construction Co., Ltd., general contractor.



SLIDING SYSTEM FOR MINIMUM EQUIPMENT—To gain the substantial cost advantages of minimum equipment, Frank Briscoe Co., Inc., here uses sectionalized set-ups of "Trouble Saver" Shoring which can be slid from pour to pour for the 8" floor slab of the new 250' by 275' Western Electric Co. Bldg. Boston. 22' x 125' shoring sections, with forms and dropheads in place, are slid forward between columns by cables attached to wood sills. Bulldozer used for power. Photo shows one narrower section just after movement.

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literature

Film on slip-form paver. "Low Cost Concrete Highways With the Slip-Form Paver" is the title of a new 16 mm. sound-color film prepared by the Portland Cement Association. It shows how concrete pavement is placed with the latest model of slip-form paver. It includes the various methods of fine grading operations, as well as mixer operations for shoulders and roadbeds where shoulder widths will not permit use of the mixer. It depicts all of the paving operations with a slip-form paver from grading and placement to the curing and sawing of joints. The final sequence features a ride down a recently completed section of Interstate highway in Colorado, where roughometer tests show it to be comparable to paving by conventional methods in that area. Portland Cement Association, 33 West Grand Avenue, Chicago 10, Ill.

Tractor-shovel. Pictures in this brochure, No. 327, compare the Payloader tractor-shovel design features with those of conventionally designed tractor-shovels. The manufacturer claims that these features make this equipment easy to operate over the roughest terrain and supply more powerful digging action and greater stability. Pictures of numerous attachments which multiply the usefulness of the Payloader are included. The Frank G. Hough Company, Libertyville, Ill.

Epoxy-Reactive polymer. Versamid 140 is a resin product which has been developed to improve the performance and versatility of formulated products based on epoxy resins. Properties claimed for it are low viscosity and good heat distortion, tenacious adhesion to a variety of materials, excellent impact resistance as films or castings, chemical and solvent resistance, ability to inhibit corrosion of metals, permanent internal flexibilization, low shrinkage, and low exotherm. The material is described in technical bulletin 11-G available from General Mills, Inc., Chemical Division, Box 191, Kankakee, Ill.

Film on calcium chloride. "Quality Concrete with Calcium Chloride," a 16-mm. color-sound motion picture suitable for showing to ready mixed concrete associations, contractors, schools, civil and structural engineers, architects and other technical groups, pictures the use of calcium chloride in concrete to provide faster set and high early strength as well as improved workability, density and ultimate strength. The film shows the importance of these factors to all types of concreting applications in both summer and winter, and illustrates proper handling procedures for using calcium chloride in concrete. The Dow Chemical Company, Midland, Mich.

Basement window forms. A bulletin on Copco's heavy duty universal pouring forms for double lock basement windows makes the claim that the forms may be used efficiently many times over to reduce costs. This firm manufactures a broad line of building products for concrete construction. Copco Steel and Engineering Company, 14035 Grand River Avenue, Detroit 27, Mich.

Truck parts. Service and parts customers of this manufacturer will find this new booklet, "Parts Want Book," a handy means of listing needed parts for White-Autocar trucks. The White Motor Company, Service Sales Department, Cleveland 1, Ohio.

Hoists. A hydraulic and automatic hoist with a capacity of 1,500 pounds and a new economical mechanical hoist with a 1,000-pound capacity are described in literature available from Tubular Structures Corporation of America, 2960 Marsh Street, Los Angeles 39, Calif.

Wire rope. A handbook contains 36 pages of up-to-date information, comprehensively illustrated, on points you need to know in buying, selling or using wire rope. It explains how to select the right rope for your specific needs, methods of socketing, splicing and installation and important points on safety. Wire Rope Corporation of America, 609 North 2nd Street, St. Joseph, Mo.

literature

Swimming pool construction. "Profitable Swimming Pool Forming" is the title of a booklet which contains comprehensive how-to-do-it information on four of the more popular standard swimming pool plans, and shows examples of custom pool construction. Basic form layouts, detailed drawings and spacing tables for the four designs are included. Since construction costs vary from area to area, a materials breakdown is given for convenience in estimating costs for each design. Gates & Sons, Inc., 80 South Galapago, Denver 23, Colo.

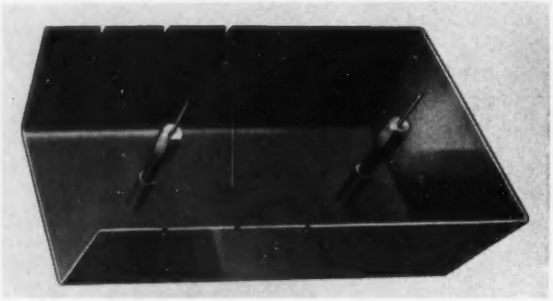
Concreting of airport pavements. A new 20-page publication discusses problems encountered in concreting of airport pavements and structures. Job story reports cover nine important airport projects in the United States, Canada and the Dominican Republic. Text and photographs illustrate the importance of quality control and good concreting practice in meeting the increasingly higher concrete requirements now specified for this type of work. Discussion includes the problem of pavement cracking under hot weather placing conditions, 900 psi flexural strength concrete for special arresting gear test center, and the concreting of banked turn-offs for increased runway capacity. The Master Builders Company, 7016 Euclid Avenue, Cleveland 3, Ohio.

Plywood construction facilities. Construction plans for a dozen of the temporary facilities most frequently needed by builders and large contractors are now available in a booklet. Plans call for exterior-type fir plywood and lumber construction, with items ranging from construction sign details to a portable office. The booklet also contains a grade-use chart of the various fir plywood grades appropriate to construction of this type. Single copies of the booklet, form no. 58-460, are free, with quantity orders costing $2.50 per 100. Douglas Fir Plywood Association, 1119 A Street, Tacoma, Wash.

Soil testing. A new booklet, "Right on the Site," tells how soil investigations can provide architects, engineers, contractors and owners with dollar-saving facts about sites through complete and accurate soil information before construction begins. Complete analyses answer the question, "Is the soil suitable for the use intended?" Concrete testing is offered as an added service. Empire Soils Investigations, Inc., Dryden, N. Y.

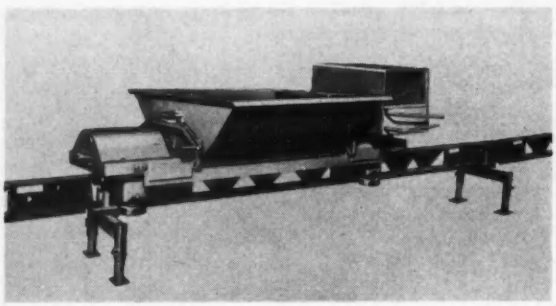
Single strand tensioning. The pulling of single strands one at a time is gaining favor over the pulling of multiple strands all at once in prestressing operations. It is said to be faster, to require less expensive equipment and to lend itself well to depressed strands. Folder No. 394 explains how this system works and gives comparative cost figures. Prestressed Equipment Company, P. O. Box 1264, Lakeland, Fla.

equipment tools and materials



Beam Pocket

This ruggedly constructed, lightweight unit, speeds and simplifies the forming of beam pockets. It is adaptable to beam depths of 6, 8, 10 and 12 inches. Of heavy gauge steel, it can be attached to the inside form in a few seconds by means of two 6-penny, double-headed nails. The tapered shape permits easy stripping right along with the forms and results in clean, smooth pockets which are completely free of nail marks. The unit is re-usable. **Simplex Forms System, Inc., 5605 Industrial Avenue, Rockford, Ill.**



Materials Handler

This portable self-propelled materials handler transports concrete and other construction materials over an easily set up monorail system. It makes round trips from supply point to destination unattended and stops automatically. The power unit and the trailer unit carry a 29.2 liquid-level cubic-foot capacity, 20 cubic feet of concrete or 3,000 pounds of blocks, bricks, stone or lumber. Rails are easily set-up and additions to the tracks can be made as the job progresses. **Chain Belt Company, 4701 West Greenfield Avenue, Milwaukee 14, Wisc.**

book reviews

Construction Accounting and Financial Management. *By William E. Coombs. Published by F. W. Dodge Corporation, 119 West 40th Street, New York 18, N. Y. 490 pp. Illus. $12.85.*

William E. Coombs, an attorney and certified public accountant, has devoted the major portion of his career to solving the accounting, financial and legal problems of contractors. In this new book he describes and specifically recommends proper accounting and management procedures for the construction industry, tells what records to keep and why, and relates accounting and record keeping to the size of the firm and the type of work being done.

Starting with the basic operating and accounting patterns of a construction firm and their important relationship, the author covers every aspect of construction accounting and management, including such topics as pre-job procedures, purchasing and subcontracting policies and procedures, change order routines, accounting for labor, materials, supplies and equipment, subcontract costs and overhead. He thoroughly examines and explains vouchering and disbursement control, accounting for income and cash receipts, classification of accounts, financial statements and reports, auditing, insurance, and business machine applications.

The book will be of use to contractors, management and financial personnel in the construction industry, public accountants, architects, engineers and private and public institutions concerned with construction credit and financing.

Compilation of ASTM Standards on Cement. *Published by American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa. 278 pp. $3.50.*

Of major assistance to engineers, public agencies and laboratories concerned with the national highway construction program, and to the users of cement in concrete structures and buildings, is the new compilation of ASTM Standards on Cement. The general refinement of standards by Committee C-1 on Cement is evidenced by the up-dating of 15 of the 34 standards included. Of particular interest are the revisions in the Specifications for Portland Blast-Furnace Slag Cement (C 205) and the Methods of Sampling Hydraulic Cement (C 183).

In addition to the standard specifications, methods of test, and definition of terms, appendixes contain a Manual of Cement Testing with detailed information to assist the plant chemist in the performance of the cement tests; a list of selected references; and a discussion on analytical balances and weights. This 13th edition supersedes the 1957 edition.

Index to Advertisers

letters

More Ready Mix History

Sir:

I was interested in reading the advertisement in the January issue of *Concrete Construction* (Concrete Transport Mixer Company, inside front cover) which states that the first concrete mixed and delivered in a mixer truck was used for the foundation of Children's Hospital in San Francisco, California.

It is my belief that the advertisement is correct in this statement, but you might be interested in further information regarding this first load of ready mixed concrete.

The following facts I believe to be true:

1) The concrete was placed in the foundation of the Children's Hospital in San Francisco.
2) The contractor was K. E. Parket Company.
3) The superintendent was Joe Nusbaum.
4) The concrete inspector at the job site for Abbot A. Hanks, Inc., was Arthur Atherton.

The following facts I am sure of:

1) The truck was loaded at the plant of Pacific Gravel Company at 18th and Shotwell Streets. This company consisted of four partners, namely: Carl Henning, Tom Butler, Oleson and Mrs. Walsh.
2) The dispatcher was Arthur Jones.
3) The plant inspector for Abbot A. Hanks, Inc., was myself.
4) The truck driver was Ray Coyle.
5) The truck was a White with a Barrymore mixer body. This body was stationary, of the bath tub type with a revolving center shaft, with attached rubber edged paddles. A pipe line with small holes every foot ran around the rim of the tub for adding the mixing water.
6) The aggregates were measured by volume and the cement by sacks.

I hope that this additional information may interest you.

WINWRIGHT BENHAM
Abbot A. Hanks, Inc.
1300 Sansome Street
San Francisco 11, California

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